

LISTING OF THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

1 (currently amended): A high-strength hot-rolled steel sheet having ferritic structure strengthen by TiC and/or NbC precipitates and adding no Mg excellent in hole expandability and ductility, consisting essentially of, in terms of a mass%:

C : 0.01 to 0.09%,
Si : 1.2 to 1.5%,
Mn : 0.5 to 3.2%,
Al : 0.003 to 1.5% 0.04%,
P : 0.03% or below,
S : 0.005% or below,
Ti : 0.10 to 0.25%,
Nb : 0.01 to 0.05%, and

at least one of Cu: 0.1 to 1.5% and Ni: 0.1 to 1.0%, and

the balance consisting of iron and unavoidable impurities; and

satisfying all of the following formulas <1> to <3>:

$$0.9 \leq 48/12 \times C/Ti < 1.7 \quad \dots \quad <1>$$

$$50,227 \times C - 4,479 \times Mn > -9,860 \quad \dots \quad <2>$$

$$811 \times C + 135 \times Mn + 602 \times Ti + 794 \times Nb > 465$$

... <3>, and

having strength of at least 980 N/mm².

2 (currently amended): A high-strength hot-rolled steel sheet having ferritic structure strengthen by TiC and/or NbC precipitates and adding no Mg excellent in hole expandability and ductility, consisting essentially of, in terms of a mass%:

C	:	0.01 to 0.09%,
Si	:	1.2 to 1.5%,
Mn	:	0.5 to 3.2%,
Al	:	0.003 to <u>1.5%</u> <u>0.04%</u> ,
P	:	0.03% or below,
S	:	0.005% or below,
Ti	:	0.10 to 0.25%,
Nb	:	0.01 to 0.05%,

at least one of Mo: 0.05 to 0.40% and V: 0.001 to 0.10%, and
at least one of Cu: 0.1 to 1.5% and Ni: 0.1 to 1.0%, and the balance
consisting of iron and unavoidable impurities; and satisfying all of the following formulas
<1>' to <3>':

$$\begin{aligned} 0.9 \leq 48/12 \times C/Ti < 1.7 & \quad \dots <1> \\ 50,227 \times C - 4,479 \times (Mn + 0.57 \times Mo + 1.08 \times V) > \\ -9,860 & \quad \dots <2> \\ 811 \times C + 135 \times (Mn + 0.57 \times Mo + 1.08 \times V) + 602 \times Ti + 794 \times Nb > \\ 465 & \quad \dots <3>, \text{ and} \end{aligned}$$

having strength of at least 980 N/mm².

Claims 3 to 5: (canceled).

6 (withdrawn): A production method of a high strength hot rolled steel sheet excellent in hole expandability and ductility according to claim 1, comprising the steps of:

finishing hot rolling by setting a rolling end temperature to from an Ar₃ transformation point to 950°C;

cooling a hot rolled steel sheet to 650 to 800°C at a cooling rate of at least 20°C/sec;

air cooling then the steel sheet for 0.5 to 15 seconds;

further cooling the steel sheet to 300 to 600°C at a cooling rate of at least 20°C/sec; and

coiling the steel sheet.